

NEPTUNE.

CAMBRIDGE. Meridian. (Professor Challis.)

1848.	Greenwich M.T.	R.A.	Obsd—Calc ^d .	N.P.D.	Obsd—Calc ^d .
	^h ^m ^s	^h ^m ^s	^s	[°] ['] ["]	["]
July 17	14 32 55	22 17 26.16	—1.04	101 20 2.5	+5.8
18	14 28 55	17 21.61	0.92	20 30.8	6.2
26	13 56 48	16 41.49	1.00	24 25.7	3.8
Aug. 1	32 40	16 8.89	0.81	27 39.9	4.7
2	28 38	16 2.99	1.05	28 14.3	5.9
5	16 33	15 45.72	1.05	29 54.0	4.9
7	8 29	15 33.97	1.07	31 2.0	4.5
9	13 0 26	15 22.12	1.04	32 10.4	3.9
10	12 56 24	15 15.99	1.17	32 48.3	7.1
17	28 10	14 33.42	1.02	36 51.2	3.5
19	20 6	14 20.84	1.21	38 1.5	2.7
21	12 1	14 8.21	1.40	39 15.5	5.5
22	7 59	14 2.14	1.25	39 51.3	5.6
23	12 3 57	13 55.85	1.29	40 26.2	4.9
24	11 59 55	13 49.60	1.31	41 2.6	5.7
29	39 44	13 18.38	1.37	43 59.0	4.7
Sept. 1	27 38	12 59.85	1.34	45 44.7	5.2
2	23 36	12 53.74	1.30	46 20.0	5.7
4	15 32	12 41.51	1.30	47 30.7	7.4
6	7 28	12 29.32	1.36	48 37.2	5.4
7	11 3 26	22 12 23.27	—1.40	101 49 11.6	+6.0

The N.P.D. have been corrected by $-0''.27$ for parallax.

DURHAM. Equatoreal. (Prof. Chevallier & Rev. R. A. Thompson.)

1848.	Greenwich M.T.	R.A.	Obsn—Eph ^s .	N.P.D.	Obsn—Eph ^s .	No. of Obs.	
	^h ^m ^s	^h ^m ^s	^s	[°] ['] ["]	["]		
Aug. 28	12 4 48.4	22 13 24.47	—1.40	101 43 22.3	+2.8	6	B.A.C. 7821
29	11 30 17.1	13 18.48	1.31	43 58.2	4.1	6	— —
31	11 55 40.7	13 6.00	1.25	45 11.5	6.3	7	— —
Sept. 1	12 11 33.0	12 59.59	1.41	45 42.6	2.0	3	— —
6	9 51 13.8	12 29.59	1.41	48 34.6	4.6	2	— —
8	11 36 44.1			49 43.2	3.2	2	— —
12	10 1 22.2	11 53.67	1.65	51 57.2	6.9	7	— —
	12 8 40.8	53.15	1.65	58.9	5.7	6	B.A.C. 7740
14	10 24 48.7	11 41.89	1.78	53 0.3	4.9	1	— —
	10 41 54.0	42.05	1.59	2.7	6.9		Meridian, faint
16	10 33 51.9	22 11 30.68	—1.61	101 54 7.0	+8.1		Meridian, faint

Corrections have been applied for parallax, and the results are compared with Mr. Adams' Ephemeris.

Mean Places of Stars, June 1, 1848, from Meridian Observations, Durham.

	R.A.	No. of Obs.	N.P.D.	No. of Obs.
	^h m s		[°] ' "	
B.A.C. 7740	22 4 20.26	2	101 48 46.8	1
B.A.C. 7821	22 18 36.85	2	101 59 54.5	2

Nearly agreeing with B.A.C. in north polar distance. The right ascensions of the catalogue seem to be about 0^s.5 too large.

Elements.

Mr. Sears C. Walker gives the following elements of *Neptune* as the latest results of his investigations:—

$$\begin{aligned}
 \pi &= 47^{\circ} 12' 6.50'' \\
 \Omega &= 130^{\circ} 4' 20.81'' \\
 i &= 1^{\circ} 46' 58.97'' \\
 e &= 0.00871946 \\
 \mu &= 21''.55448 \\
 M &= 328^{\circ} 32' 44''.20 \quad \text{Green}^h \text{ M. Noon, Jan. 1, 1847} \\
 T &= 164.6181 \quad \text{Tropical Years.}
 \end{aligned}
 \left. \begin{array}{l} \\ \\ \\ \\ \\ \\ \end{array} \right\} \text{M. Eq. Jan. 1, 1847}$$

Professor Peirce has computed the perturbations of *Uranus* by *Neptune*, taking an approximate value of his elements and using the mass which is given by Lassell's Satellite. He has stated the results of a comparison between the observed and calculated places of *Uranus*, from 1690 downwards, using these perturbations, and finds them satisfactory throughout.

"It will be perceived," he says, "from this table, that the motions of *Uranus* contain no indications of another external planet, or of any error in the mass of *Saturn*. *Neptune* stands, therefore, in direct opposition to the proposition that no planet placed at a less mean distance than 35 times the distance of the earth from the sun, can possibly account for the observed irregularities in the motion of *Uranus* to within 5" of arc for modern observations and 10" for ancient ones.* The table is computed from Walker's last elements of *Neptune* as a basis."

* This alludes to the limit 35.04 which M. Le Verrier assigned as the lowest value of the mean distance of the planet exterior to *Uranus*. There has been a good deal of discussion of late upon this point, which may be found in the recent numbers of the *Comptes Rendus* and in the *Athenæum* journal. Professor Peirce has given in his table the elements of the exterior planet as found by Mr. Adams on two hypotheses of mean distance, and he seems to have concluded that these contained the *final results* obtained by Mr. Adams. This is not the case, and it is worth while to refer particularly to Mr. Adams' letter of Sept. 2, 1846 (*Monthly Notices*, vol. vii. p. 137). Having obtained elements of the disturbing planet on two hypotheses of mean distance, Mr. Adams examines how far the observations of *Uranus* correspond to the two hypotheses, and concludes, that from 1712 almost to 1840 the observations are equally well represented on either hypothesis, but that, towards the end of that time, and later, the errors begin to increase, until, in 1843, they are very sensible; being, moreover, always larger in the hypothesis of the larger mean distance. He infers (p. 139), "that the agreement between theory and observation would be rendered very close by assuming the ratio of the mean distances of *Uranus* and its disturbing planet to be as 0.57